

Claims

What is claimed is:

1. A voltage-controlled oscillator comprising:

a voltage-controlled phase-shift circuit for outputting an output signal in which the phase of an input signal is shifted by a predetermined amount in accordance with an external control voltage;

a plurality of SAW resonators, each of which resonates at a predetermined resonance frequency;

first switching means for selecting one of said plurality of SAW resonators in accordance with the external control voltage;

frequency selection means for selecting an output signal having a predetermined resonance frequency from one SAW resonator among said plurality of SAW resonators, which is selected by said first switching means;

an oscillation differential amplifier for amplifying and outputting a resonance signal of said predetermined resonance frequency; and

a feedback-buffer differential amplifier for inputting the output signal from said oscillation differential amplifier,

wherein said voltage-controlled phase-shift circuit, the SAW resonator selected by said first switching means, said frequency selection means, said oscillation differential amplifier, and said feedback-buffer differential amplifier form a positive-feedback oscillation loop.

2. A voltage-controlled oscillator comprising:

a voltage-controlled phase-shift circuit for outputting an output signal in which the phase of an input signal is shifted by a predetermined amount in

accordance with an external control voltage;

a plurality of SAW resonators, each of which resonates at a predetermined resonance frequency;

first switching means for selecting one of said plurality of SAW resonators in accordance with the external control voltage;

frequency selection means for selecting an output signal having a predetermined resonance frequency from one SAW resonator among said plurality of SAW resonators, which is selected by said first switching means;

an oscillation amplifier for amplifying and outputting the predetermined resonance signal selected by said frequency selection means;

a feedback-buffer amplifier for inputting the output signal from said oscillation amplifier; and

a plurality of output amplifiers for inputting a signal from said oscillation amplifier and outputting an output signal,

wherein said voltage-controlled phase-shift circuit, the SAW resonator selected by said first switching means, said frequency selection means, said oscillation amplifier, and said feedback-buffer amplifier form a positive-feedback oscillation loop.

3. A voltage-controlled oscillator according to Claim 1, wherein said frequency selection means is formed as an LC parallel resonance circuit having an inductance element and a capacitance element,

there is provided a passive element connected in series between one end of each of said plurality of SAW resonators and a ground, and

when one of said plurality of SAW resonators is selected, said passive

element connected in series to said selected SAW resonator is connected in parallel to said LC parallel resonance circuit.

4. A voltage-controlled oscillator according to Claim 1, wherein said frequency selection means is formed as an LC parallel resonance circuit having an inductance element and a capacitance element,

there are provided:

second switching means; and

a passive element connected in series to said second switching means; and

when one of said plurality of SAW resonators is selected, said passive element selected by said second switching means, corresponding to said selected SAW resonator, is connected in parallel to said LC parallel resonance circuit.

5. A voltage-controlled oscillator according to Claim 1, wherein said frequency selection means is formed as an LC parallel resonance circuit having an inductance element and a variable capacitance element,

there is provided control voltage generation means for generating a control voltage for controlling the capacitance of said variable capacitance element in accordance with an external control signal.

6. A voltage-controlled oscillator according to Claim 1, wherein there is provided signal selection means for selecting, as said positive-feedback oscillation loop, one of the output terminals of said feedback-buffer differential amplifier having an inverting output terminal and a non-inverting output terminal.

7. A voltage-controlled oscillator according to Claim 1, wherein said differential amplifier is a differential amplifier circuit using an ECL line receiver.

8. A voltage-controlled oscillator according to Claim 3, wherein said passive element connected in parallel to said LC parallel resonance circuit is a capacitance element.

9. A voltage-controlled oscillator according to Claim 3, wherein said frequency selection means comprises an NTC thermistor having negative temperature characteristics.

10. An electronic device comprising a voltage-controlled oscillator according to Claim 1.

11. A voltage-controlled oscillator according to Claim 2, wherein said frequency selection means is formed as an LC parallel resonance circuit having an inductance element and a capacitance element,

there is provided a passive element connected in series between one end of each of said plurality of SAW resonators and a ground, and

when one of said plurality of SAW resonators is selected, said passive element connected in series to said selected SAW resonator is connected in parallel to said LC parallel resonance circuit.

12. A voltage-controlled oscillator according to Claim 2, wherein said frequency selection means is formed as an LC parallel resonance circuit having an

inductance element and a capacitance element,

there are provided:

second switching means; and

a passive element connected in series to said second switching means, and

when one of said plurality of SAW resonators is selected, said passive element selected by said second switching means, corresponding to said selected SAW resonator, is connected in parallel to said LC parallel resonance circuit.

13. A voltage-controlled oscillator according to Claim 2, wherein said frequency selection means is formed as an LC parallel resonance circuit having an inductance element and a variable capacitance element,

there is provided control voltage generation means for generating a control voltage for controlling the capacitance of said variable capacitance element in accordance with an external control signal.

14. A voltage-controlled oscillator according to Claim 11, wherein said passive element connected in parallel to said LC parallel resonance circuit is a capacitance element.

15. A voltage-controlled oscillator according to Claim 11, wherein said frequency selection means comprises an NTC thermistor having negative temperature characteristics.

16. A voltage-controlled oscillator according to Claim 4, wherein said passive element connected in parallel to said LC parallel resonance circuit is a

capacitance element.